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Editorial

The Journal

The University of Toronto Medical Journal is a democratic institution. It is a mode of expression and a source of information published for the students and by the students. It is their common responsibility. Unfortunately, for all too many students, the Journal is a periodical which comes out once a month and for which they pay a modest yearly fee, and their responsibility ends there. They do not seem to realize that if there is to be a Journal, it must have their support in the form of articles or it cannot survive.

This year, the student response to requests for articles has been most discouraging to the Editors. It has come to the point where the facts must be faced squarely. If the students think that they are too busy to support their Journal by writing articles for it, then publication will have to stop. If, on the other hand, it is desired that the Journal should continue, then the students must be prepared to sacrifice a small portion of their time and effort in the preparation of material for articles.

In a short time now, the responsibility of editing the Journal will be assumed by the new staff. It is sincerely hoped any student who is approached by them to write an article will bear in mind that the Journal is his, and his responsibility when he is making his decision.

PSYCHOLOGY'S ROLE IN MEDICAL PRACTICE

By S. R. LAYCOCK, M.A., M.ED., PH.D.
Professor of Educational Psychology, University of Saskatchewan

There have been times in its history when medicine conceived of its task as being confined to the physical welfare of the human organism—usually the diagnosis and treatment of organic disease. To psychology was allotted the domain of human behavior in its intellectual, emotional and social aspects. This division of the human organism between the physican and the psychologist has been found to be highly artificial. It is rapidly being replaced by the point of view that an understanding of psychology is as vital to the physician as an understanding of physiology.

The present trend in medicine leads to the belief that the whole patient comes to the doctor's office—not just a disordered liver, a diseased gall bladder, a heart lesion or a septic throat. Rather a *sick person* comes to the doctor's consulting room. This sick person is *not* made up of body *and* mind. No longer do we talk of the influence of mind over matter as if the two were distinct and separate parts of the individual. Rather the human organism is a unity. Confronted by all sorts of situations such as climbing stairs, starting a car, cooking a dinner, selling an article or playing a game the human individual reacts as a whole. True, for purposes of our thinking, we often classify parts of the response as muscular responses, glandular responses, remembering responses, feeling responses, thinking responses, etc. However, we need to remind ourselves that this division is highly artificial; that none of these processes exist in isolation; that each one is merely an *aspect* of the way the organism responds to the situation and that each profoundly affects the others and therefore the response of the organism as a whole.

If the above is true, every doctor must do more than think of a patient as having a certain blood pressure and blood count, a certain basal metabolism, etc. Rather he must see the patient as an organism having a certain original structure, certain capacities and certain basic needs of its own as well as the necessity of adjusting to a wide variety of environmental factors and stresses.

Every living organism has to continually adjust to its environment. When it ceases to make effective adjustments it dies. Indeed living *is* adjusting. The individual who enjoys physical and mental health is making a satisfactory adjustment to life's conditions. On the other hand, physical illness, mental illness, delinquency, and other forms of behavior maladjustments may be viewed as the failure on the part of the individual to adjust to his own needs and the conditions of his environment. As a result the individual suffers. He is "dis-eased" in the literal sense of the word. Neither the physically sick nor those maladjusted in personal and social behavior can carry on adequately the normal processes of living. From a modern point of view all diseases are maladjustments. Likewise all the maladjusted are sick persons.

It has long been known that delinquency and other social and emotional maladjustments are seldom the result of a single cause. Rather they are a response of the whole organism in which many organic and psychological factors are intertwined. In the same way organic diseases or functional disorder may be viewed as a breakdown of the organism as a result of many organic and psychological factors.

To understand the patient's present lack of adjustment to the normal processes of living, the physician needs to understand and to see in their relationships a wide range of factors, genetic, organic, psychological and environmental. Practically all doctors are aware of the necessity of seeking data regarding the patient's early health, his disease history, his size and general bodily build, his degree of visual, auditory and

orthopedic defect, his accidents, his degree of motor control and muscular co-ordination. These are important for more than their own sake. In addition to their physical aspects every one of them has affected the individual's mental health and his ability to make successful social adjustments to his fellows in play and work. Physical disease and disability often occasion psychological stresses, strains, frustrations, conflicts, fears and anxieties thereby depleting body-reserves. Likewise psychological factors often occasion physical dysfunction and disease. The physiological accompaniment of fear, anxiety, rage, grief and other strong emotions are well known. Under such conditions the digestive processes are switched off, the heart and lungs are stimulated to strong action, the liver secretes its store of blood sugar, and the adrenal glands discharge excessive amounts of adrenalin. Worry, anxiety, fear, anger, grief, and excitement are expensive luxuries. They unnecessarily use up body capital. Their continued use is apt to result in serious disturbance of physiological functions and even in organic disease.

In addition to the data listed above most physicians go on to record facts about the personal habits of the patient—habits of eating, sleeping, working, daily routine and of sex life. Obviously these habits may result in many physical and psychological strains in the individual's daily adjustment to his environment.

An increasing number of physicians investigate the personal and social factors of the individual's personality. They get help in understanding the patient by data regarding his personality type, his degree of intelligence, his educational background, his emotional traits like shyness, resentments and fears; his defense mechanisms like bullying, bossiness, stealing, rationalizations, etc., his initiative and ambitions, his hobbies and vocational interests. A knowledge of the early home life of the individual and of the intelligence, education, occupation, and economic status of the parents as well as the type of "emotional climate" they created and the type of discipline they used in the home is also of help. The physician will also need to know a good deal about similar factors in the home in which his patient new lives. For example, it may be quite as important to know that a patient now lives. For example, it may know the results from the use of the stomach-pump. "Dis-ease" is to be viewed as the result of more stresses and strains—physical and psychological—than the resources of the organism enable it to endure.

Viewing the patient, therefore, as a whole person who has not only viscera, cells and tissue but also hopes, fears, anxieties, memories, problems and conflicts, is necessary if the physician is to understand the patient's present failure to function as a healthy organism. In other words a case history must include not merely a disease history but as complete data as it is possible to get concerning the individual as a person—both in his early development and in his present relationships in school, home, shop, factory and community. The ignoring of many aspects of the individual's response to his environment results in many physicians spending their time treating symptoms rather than causes. Symptoms are, after all, merely a patient's responses in attempting to adjust to his environment. Good diagnosis involves the evaluation of the interrelationships of a wide range of factors. These include more than such organic interrelationships as exist between the endocrines and the organs of digestion. They involve also the relationships between such physiological processes as digestion and respiration and the thinking, feeling, and remembering responses of the organism. They also involve the interrelationships between the individual's physiological functioning and the various aspects of the environmental forces—physical, emotional, social and intellectual — which impinge upon him.

Physicians tend to develop skill in evaluating the physiological needs of the individual patient. These needs are the obvious ones for food, drink, air, proper temperature, rest, sleep, elimination and

relief from certain tensions resulting from glandular activity. Doctors are not, however, always fully aware of the psychological needs of the individual. While psychologists still differ in their classification of these, for purposes of this paper, we shall consider three: (1) the need for human response or security (2) the need for status or recognition and (3) the need for mastery or achievement. Every patient who comes to a doctor's office brings these three needs with him as well as some measure of success or failure in finding fulfillment for these needs.

(1) *The Need for Human Response or Security*

The most basic psychological need of all human beings is to be accepted by family and friends for their own sakes—for *who* they are. For example, it is important that a baby come into a home where it is wanted and loved. In infancy, childhood and adolescence this need to feel secure in the love and affection of parents is fundamental to wholesome growth. How important it is can be seen when children do not have that sense of human response and security. All sorts of maladjustments from bedwetting, stubbornness, shyness and aggressive traits like bullying, boasting and bossiness as well as downright delinquency like stealing are likely to appear. All the experience of child guidance clinics indicates that the insecure child is a problem child. Parents develop insecurity in children in a variety of ways—by indifference, by favoritism, by harsh discipline, by too lax discipline, and oddly enough by overprotection and coddling.

As children grow up they need not only human response and security from their parents but also from friends as well. This remains a paramount need throughout life as social workers well know. Many adults, and particularly older folk, have as one of their major problems the difficulty of still feeling they matter to family and friends.

Probably the most outstanding aspect of the need for human response and security is to be found in marriage. Relief from tension due to glandular activity is not as important a part of sex as is commonly supposed. The fulfilling of the need for human response and security is much more important. Failure to find fulfillment of this need is one of the major causes of failure in marriage.

All people to be mentally healthy must be emotionally secure. The implications of this statement are great. Even economic security is, at base, emotional security—freedom from fear and anxiety. And the need to have a sense of fellowship with the universe which expresses itself in religion is closely related to the need for security and should not be lightly dismissed by physicians.

In the everyday practice of his profession the doctor deals continually with emotionally immature individuals. J. W. Barton has estimated that over fifty percent of all patients consulting physicians or seeking hospital treatment have no real organic trouble. That means that they are not adjusting to their environment chiefly because of failure to satisfy their basic psychological needs. A great many neurotics are emotionally insecure persons desperately trying to find a solution to their problem through illness. In addition, a great many emotionally insecure folk create additional problems for doctors and nurses even when their trouble is primarily organic. They develop accessory and harmful symptoms because of their emotional insecurity.

However, entirely apart from the emotionally insecure individual, every patient who comes to a doctor's office has need of human response and security. What a doctor does to fulfill this need depends upon how well-adjusted he is to his profession and upon his attitude towards his patients. The physician who is genuinely interested in his patient ministers to this need. Patients *do* feel better just from talking with him. He has taken away their body-destroying response of fear and makes them feel secure, thus assisting the natural reparative process. Since the strong emotions of fear, anxiety, rage and grief deplete

body-reserves it is the physician's job to treat these emotions. Indeed the physician's three-minute call at the bedside of a convalescing patient chiefly serves this purpose since he often makes no other investigation.

(2) *The Need for Status and Recognition*

Since illness and especially going to hospital often interferes with an individual's normal channels of human response and security it is important that admitting officers at hospitals, supervisors, nurses and attendants meet this need by a genuine interest in the patient. This is an essential part of the process of making sick persons well.

Next to being loved and accepted for *who* they are the most important need of humans is to be accepted for *what* they are. From the cradle to the grave everybody seeks status and recognition. The little child does his "cute" tricks, and gains recognition by success in walking, talking, playing patty-cake, making mud pies, playing games and later on by achievement in schoolwork and athletics. However, if denied an outlet in wholesome ways he may gain recognition and status by being a "horrid" child, by disobedience, by bed-wetting, by stealing and lying or by other delinquent behavior.

Adults gain recognition and status in a thousand ways—by being good doctors, nurses, athletes, musicians, farmers, mechanics, public speakers, etc. Here again old folk have a real problem. Too often they are retired without the continued opportunity to achieve status by having work they may do. Everybody should, in early life, develop a hobby as a sort of psychological insurance policy against old age. It must be a hobby which can be carried into old age and by which one can continue to gain recognition by ministering to the pleasure and welfare of others. Denial of an outlet for his need for status results in the desperate pursuit of devious ways of obtaining it. A great deal of antisocial behavior such as crime is the result of an attempt to obtain status and recognition. Certainly a large share of neurotic illnesses can be understood only in the light of this need to find status. Many people do "enjoy" poor health. A complaint which baffles doctors gives to many people a sense of distinction and importance. It enables them to pose as unique among their friends. On the other hand, many miraculous cures have been wrought when the individual gets more prestige out of the cure than he previously got out of the disease. If getting well increases the person's status and recognition it is likely to occur more quickly than otherwise would be the case.

For the great majority of normal patients the doctor still needs to be aware of this need for status and recognition which may be seriously thwarted by illness. Sick folk cannot continue the activities by which they normally achieve recognition. The doctor must help them to face this deprivation and to find temporary status in cooperating in getting well, in putting up a good fight and in enduring the discomfort of treatment.

(3) *The Need for Mastery and Achievement*

Allied to the need for status is the need for mastery and achievement. This need involves the more individual satisfactions which come from overcoming opposition, from dominating people and things, from excelling a rival and from succeeding in general. This need is so important that many think it is really the one which "make the world go round". All of us are challenged in a normal fashion by a bottle that won't open, by a block of wood which won't split or by a business or professional or intellectual problem we can't solve. Indeed the overcoming of disease is one of the doctor's own great satisfactions. Games, contests, our efforts in our daily tasks, our resistance to aggression and our willingness to give leadership in all phases of human endeavor—all these bear eloquent testimony to the great importance of this need in motivating human behavior.

Obviously the need for mastery and

achievement can express itself in socially useful or socially harmful ways. It can result in the work of a Pasteur or Florence Nightingale or Madame Curie or in the attempt of Hitler to master the world. Many patients come to a doctor's office because their method of fulfulling this need has led to overstrain, tension, frustration, and inner conflicts. Physical breakdown may be the result of undue attempts to gain mastery and achievement in athletics, social life, business, or even in philanthropy. The doctor should help patients to find outlets for their need for mastery in ways that are in keeping with their physical and mental resources. In illness he must help them to find mastery in overcoming the disease by the desire to get well and by cooperating completely with himself and the nurses. As all physicians know "the will to live" makes a difference to the recovery of the patient.

In conclusion it might again be pointed out that no physician can understand his patient's failure to adjust even physically to his environment without recognizing the degree to which the individual's fundamental psychological needs have been frustrated by personal limitations or by thwartings in the environment. Many things make people sick. Doctors would do well to remember that patients come to them because *something* is wrong with them. It may not be an organic trouble yet they are none the less *sick persons.* All diseases are a failure to adjust to environmental conditions and all physical, emotional and social maladjustments result in "dis-ease" in the organism. Medicine therefore can never do its complete job unless it takes unto itself psychology even as it has taken unto itself physiology.

SYMPOSIUM ON VITAMINS

VITAMIN A

By J. F. McCREARY, M.D.

From the Wards and Laboratories of the Hospital for Sick Children, and the Department of Paediatrics, University of Toronto.

The existence of this nutritional substance has been recognized since 1913. In that year McCollum and Davis fed rats on purified food substances with the fat of the diet supplied as lard, olive oil or almond oil. On this diet the rats failed to grow, but when these fats were replaced by butter fat, cod liver oil or egg yolk fat the rats grew in normal fashion. It was apparent to McCollum that some substance present in butter fat, cod liver oil and egg yolk fat was necessary for rat nutrition. He designated this unknown substance "fat-soluble A".

In 1919 Steenbock proposed the theory that the vitamin A content of various foods was dependent upon the yellow pigment carotene found in those foods. He was able to show that if carotene were added to a vitamin A deficient diet no signs of vitamin A deficiency would develop in the rat. It was difficult to reconcile Steenbock's theory with the fact that cod liver oil, an almost colourless substance, possessed extreme vitamin A activity, and considerable doubt was thrown on Steenbock's hypothesis because of this fact. In 1929, however, Moore solved the puzzle when he demonstrated that the yellow carotene is a precursor of vitamin A and that vitamin A in its pure state is almost colourless.

In 1938 crystalline vitamin A was prepared from fish liver oils by Holmes and Corbet and careful study of the substance became possible for the first time. It is an alcohol which is highly unstable in the presence of oxygen at room temperature but which shows minimal loss even at high temperatures when air is excluded. It is destroyed by exposure to visible or to ultra-violet light.

Study of carotene reveals that it is a hydrocarbon which occurs widely in vegetable foods. It occurs in three forms: alpha carotene, beta carotene and gamma carotene. The structural formula for beta carotene is such that if it were split in the middle and water added to the severed ends of the formula two molecules of vitamin A would be formed. Alpha carotene and gamma carotene, as well as other precursors of vitamin A, cryptozanthine and dihydrocarotene, possess structural formulæ such that, if they are split in the middle and water added, one molecule of vitamin A is formed. It is believed that by this splitting process vitamin A is formed in the body of an animal from the carotene ingested in the diet.

It is apparent that the human sources of vitamin A will be supplied in two different forms: (a) from carotene, (b) from vitamin A. Carotene is widespread in the vegetable kingdom. It occurs in yellow vegetables such as carrots, squash and turnips; in yellow fruits, such as peaches; and, because carotene and chlorophyll are closely associated, it is found in high concentrations in all greens. Probably well over half of the vitamin A used by the human has its origin in the carotene in the daily diet.

Vitamin A ingested as such by the human must be obtained from animal products. No vitamin A is found in vegetables, and that which occurs in animal products is produced in the animal body from the carotene in the daily ration. Thus when we eat eggs or drink milk we ingest vitamin A which was formed in the body of the hen or the cow from the carotene in their food. In the animal body the liver serves as the storehouse for vitamin A and over 95% of the vitamin A in the body will be found in this organ. Thus animal liver is a good source of vitamin A in the human diet and liver oils, particularly fish liver oils are potent sources of vitamin A which may be used as supplements to that amount obtained in more usual food.

The fat-soluble vitamin A is absorbed from the intestinal tract in the same way as are fats. Absorption begins within an hour after ingestion and is probably complete in 8 to 10 hours. It is carried to the liver and there stored. About 100 International Units of vitamin A per 100 cubic centimeters of blood plasma are maintained in the normal circulating blood at all times. This vitamin A in the blood is maintained at the expense of the liver stores of the vitamin, and these stores must become almost totally depleted before the level of vitamin A in the blood shows an appreciable drop.

The primary function of vitamin A in the body is to maintain the epithelial structures in normal state. So long as the amount of vitamin A in the circulating blood remains within normal limits the epithelial cells of the body tend to remain healthy. When the level of vitamin A in the blood falls below the normal value certain of the more complicated epithelial structures degenerate and the cells disappear and are replaced by stratified squamous keratinizing epithelium. This metaplasia of epithelium is most likely to occur in the trachea, the genito-urinary tract and in the ducts of various of the glandular structures of the body.

Vitamin A is also concerned with the visual mechanism. It has been shown by Wald that when a bright light strikes the visual purple of the retinal cones this substance is changed to an orange pigment called retinene. Under normal circumstances the retinene combines with vitamin A to reform visual purple. A reduction of the amount of vitamin A in the circulating blood will cause interference with this mechanism for regenerating visual purple and will lead to hemeralopia or night blindness.

Night blindness is the earliest sign of deficiency of vitamin A in the human. The condition has been recognized as a clinical entity since the time of Hippocrates, and has been frequently described in the medical literature. Few reliable statistics are available on the occurrence of night blindness, but it is likely that on this continent clinical night blindness is an unusual condition. One must also bear in mind that there are many causes other than deficiency of vitamin A for night blindness, and the condition must not be considered to be in any sense specific. Based on the relation of night blindness to vitamin A, machines have been devised which measure the ability of an individual to see a dimly lighted object after a bright light has been shone in his eyes for some moments. The inability of any subject to adapt himself to vision in a dim light under these circumstances has been suggested to be evidence of deficiency of vitamin A. The lack of specificity of the test and the bizarre results obtained when humans were examined have combined to send the so-called "dark adaptation test" into disrepute.

The metaplasia of epithelium which probably represents a much later stage in the development of deficiency of vitamin A is found exceedingly rarely. In a series of 1,510 successive autopsies at the Boston Children's Hospital where evidences of epithelial metaplasia were carefully sought after they were found in only 10. It is not likely that these 10 were all due to deficiency of vitamin A, since a similar picture can be produced by certain types of infection.

The clinical picture due to metaplasia of epithelium obviously will vary with the region involved. When the bronchial tree is affected there may be an increased incidence of pneumonia and bronchitis. When the genito-urinary tract is involved the cornified epithelial cells which are sloughed off the surface of the new epithelium may provide the nuclei around which kidney stones develop. When the glands of the skin are involved in the metaplasia one finds a skin rash consisting of rough, horny excrescences due to hyperkeratotic plugs in the gland ducts. It must be emphasized again that these changes occur very rarely. Even in parts of China, where the diet is extremely inadequate, workers have found clinical evidences of deficiencies of vitamin A to be rare conditions. In this country such signs as are discussed above are probably almost non-existent.

The occurrence in these cases of cornified epithelial cells in abnormal sites forms the basis for a reliable test for

severe deficiency of vitamin A. Smears can be taken from the trachea, or catheter specimens of urine can be taken and examined for the presence of these cells. Their presence in most cases is an indication of deficiency of vitamin A.

The most severe and the best-known evidence of deficiency of vitamin A is the condition called xerophthalmia or xerosis conjunctivae. This state appears first as a dryness and a wrinkling of the conjunctiva with characteristic loss of lustre. Later small whitened areas of thickened conjunctiva appear, and these are likely to be followed shortly by infection, ulceration and loss of vision. Some idea of the rarity of this condition may be derived from the fact that in a 10-year period when there were 815,000 visits to the Hospital for Sick Children, Toronto, only one case was seen.

The most satisfactory method as yet developed to determine the vitamin A status of an individual depends upon the actual measurement of vitamin A in the blood. Carr and Price, in 1927, pointed out that when vitamin A is brought into contact with antimony trichloride, a brilliant blue colour is produced. Clausen showed that the vitamin A of blood plasma could be extracted into a petroleum ether layer and brought into contact with antimony trichloride. The resulting blue colour can be measured by a photoelectric cell colourimeter and the actual amount of vitamin A in terms of International Units evolved. The level of vitamin A in the blood is maintained at normal as long as stores of vitamin A remain in the liver, and a subject may be on a diet deficient in vitamin A for some months before the level in the blood is appreciably changed. It has been shown, however, that the level of vitamin A in the blood must be below the normal value for weeks before reliable clinical evidences of deficiency appear. During this period measurement of the level of vitamin A in the blood represents the only accurate method of diagnosing deficiency states.

The International Unit of vitamin A is the vitamin A activity of 0.6 micrograms of pure beta carotene. The requirements of vitamin A for optimal health have been variously estimated to be from 2,000 to 10,000 International Units daily. It is probably that from 4,000 to 6,000 I.U. are necessary for optimal nutrition. An average diet which contains usual amounts of vegetables and animal products supplies these amounts. Greater amounts of vitamin A are necessary where there is any defect in absorption of fat from the intestine. In coeliac disease, fibrosis of the pancreas and the various sprues the daily intake should probably be in the neighbourhood of 40,000 to 50,000 I.U. daily. It has been shown recently that in any acute infection with fever the blood level of vitamin A falls rapidly and the stores of vitamin A in the liver are quickly depleted. There may be some indication for the administration of vitamin A in the form of fish liver oils during and immediately after infections of long duration. Apart from these few exceptions the supply of vitamin A is probably quite adequate in the usual diet in this country. It is unlikely that deficiencies of vitamin A will ever present a problem of major importance.

THE VITAMIN B COMPLEX

By ELIZABETH CHANT ROBERTSON, M.D., PH.D.
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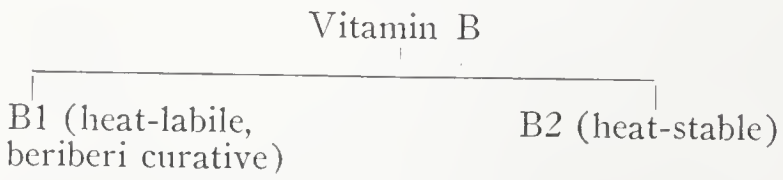
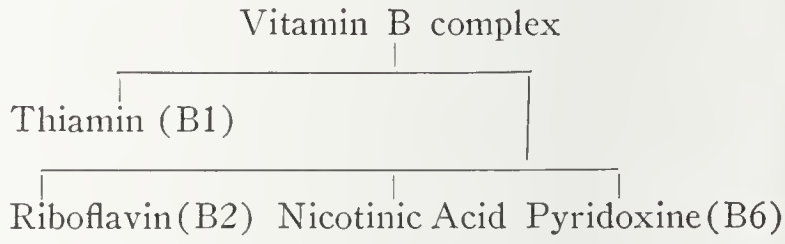
About the turn of the last century, it was discovered that beriberi, a common disease among Orientals whose diet consists largely of white rice, and which is characterized by polyneuritis, muscular wasting and cardiac dilatation, could be cured by the use of rice bran or polishings. It was not long before it was realized that it was due to the fact that white rice, from which the bran had been removed, lacked a dietary essential. Some years later (1915), Dr. E. V. McCollum of Johns Hopkins University found that a substance which he called water soluble B was essential for normal growth in rats. It was soon found that this substance would also cure beriberi (polyneuritis) in pigeons. The natural inference was that the growth promoting and beriberi curing substances were identical. Further work, however (Smith and Hendrick), showed that if yeast, which originally had both these effects, was autoclaved, the beriberi-curing effect was lost, but most of the growth-promoting property remained. The beriberi preventing factor was later called vitamin B1 and more recently it has been named thiamin, or thiamin chloride. The British sometimes refer to it as aneurin, which suggests its therapeutic effect. This is considered inadvisable by American investigators—thiamin is therefore the name to be preferred, and it is the one most commonly used. The heat stable growth promoting factor was called vitamin B2. The first separation of the B complex is shown in the following diagram:



The vitamin B2 component was also found to have the property of preventing pellagra. It is now known that the B2 component includes several vitamins, and at least three of these are essential in human nutrition. These are riboflavin (sometimes still known as vitamin B2), nicotinic acid (the antipellagra vitamin), and pyridoxine (formerly vitamin B6). Five other members of the vitamin B complex have been isolated chemically. These are pantothenic acid, para-aminobenzoic acid, inositol, biotin and choline, but as yet they have not been shown to be necessary in the human diet.

The factors known to be essential in human nutrition are shown diagramatically below:



Thiamin

A very low intake of thiamin, if continued for some time, results in the severe disease, beriberi, as mentioned above. This condition is rare among Europeans or Americans. When young rats are fed diets lacking in thiamin, growth is very poor and death soon supervenes. Generous amounts of thiamin improve the rate of growth of children (Summerfeldt and Ross, Morgan and Barry). If a rat is fed a diet lacking in thiamin he loses his appetite abruptly after a short period (during which time his small body reserves of this vitamin are presumably being used up). Such a diet also results apparently in a general lack of tone and diminished motility in the digestive tract. It has also been demonstrated that when thiamin is lacking, carbohydrates are not completely metabolised in the body. Instead much of the carbohydrate remains at the pyruvic acid stage. It is thought that the abnormally high concentration of this substance may be responsible for the anorexia and intestinal hypotonia. In brief, a deficiency in thiamin results in the incomplete utilization of the carbohydrates ingested. The vitamin B complex plays an important role during preg-

nancy and lactation. Thiamin and riboflavin are both involved in this effect, and other of the vitamin B factors may possibly play a part. The exact role of thiamin has not as yet been determined. The amount of thiamin required increases as the body weight and non-fat caloric intake becomes larger. Increased physical activity and infections also raise the requirements. Alcoholics who consume many calories in the form of alcohol and very little thiamin in the rest of their diet may develop polyneuritis due to a lack of this vitamin. This responds well to large therapeutic doses of thiamin. Polyneuritis of pregnancy may also be due to a lack of this vitamin. This is usually the result of several factors, such as pernicious vomiting, the higher requirement for this vitamin during pregnancy, and the high carbohydrate diet which is often necessary. Many cases of neuritis are, of course, not caused by a lack of thiamin. In the last few years it has been shown that the prolonged use of a diet low in thiamin results in mental depression and lack of energy. Thiamin has very aptly been called the morale vitamin. The body is unable to store thiamin — therefore a regular intake is essential.

The human requirements and best food sources for the vitamin B complex are shown in the following table. You will notice the larger requirements as the child becomes older and the increased needs during pregnancy and lactation; also that many of these factors occur together in the same foods, i.e. liver, whole grain cereals, milk.

The Canadian Council on Nutrition recently carried out a survey in Toronto on the eating habits of 80 families with incomes ranging from $1,500 to $2,400 a year. The food eaten by each member of the family for a week was determined by actual measurement. The amount consumed of several of the important food factors, including vitamin B1, was then calculated. The amounts eaten were then compared with standards set up as adequate by the Council on Nutrition. It was found that there was a widespread deficiency of vitamin B1 among these families. Other investigators have reported that only 10% of the population use whole wheat bread, and among low income families in Toronto only 6% use this food.

Figures obtained from the Bureau of Statistics, Ottawa, show that on the average Canadians take about 42 per cent of their calories in the form of white flour products and sugar. White flour contains

Vitamin B Complex

Thiamin	Infants, 0.4 mgms. Children 1 to 12 yrs., 0.6–1.2 mgms. Over 12 yrs. and adults, 1.2–2.3 mgms. Pregnancy and lactation, 1.8–2.3 mgms.	Whole grain cereals, whole wheat bread, legumes, liver, lean pork, peanut butter.
Riboflavin	Infants, 0.6 mgms. Children 1 to 12 yrs., 0.9–1.8 mgms. Over 12 yrs. and adults, 1.8–3.3 mgms. Pregnancy and lactation 2.5–3 mgms.	Milk, green and leafy vegetables, egg yolk, liver, heart, kidneys, meat.
Nicotinic Acid	Infants, 4 mgms. Children 1 to 12 yrs., 6–12 mgms. Over 12 yrs. and adults, 12–23 mgms. Pregnancy and lactation, 18–23 mgms.	Liver, kidney, lean meats, milk, green leafy vegetables.
Pyridoxine	Human requirements unknown as yet	Whole grain cereals, whole wheat bread, liver, meat, fish, vegetable fats.
Pantothenic Acid	Human requirements unknown as yet	Milk, liver, whole grain cereals, whole wheat bread.

(Recommended daily allowances as laid down by the Committee on Food and Nutrition, National Research Council, U.S.A.)
(One International Unit of Thiamin is equal to 0.003 mgms.)

very little of the B vitamins — white sugar contains none. When such large quantities of these foodstuffs are eaten it is very difficult to get enough of the B vitamins in the remaining 58% of the diet. The whole grain products, such as whole wheat flour, graham flour, rolled oats, oatmeal, cracked wheat, brown rice, dark rye flour and shredded wheat, are good sources of many of the B vitamins and iron. The vitamins and minerals of the grain are largely in the bran layers (around the outside) and in the germ. In the making of white flour, farina and the other highly refined cereals, both the germ and the bran are removed, and as a consequence white flour and these other products are very poor in the B vitamins. Usually the miller sells the bran and germ that he removes to the farmer as pig food. It is not surprising therefore that pork is a very rich source of Vitamin B1.

On the advice of their excellent nutrition experts, the British Government passed a law in August, 1940, making it compulsory for the millers to add a certain specified amount of thiamin to all white flour. The government is providing the thiamin free of charge to the millers, and although it now can be produced relatively cheaply, this service will cost His Majesty's Government many thousands of pounds annually. This step certainly indicates that some of the best nutrition investigators in the world attach a very serious significance to a chronic partial deficiency of thiamin. In the United States, the problem is being attacked in a somewhat similar manner, and at present white bread fortified with thiamin, nicotinic acid and iron is on the market. An even better type of vitamin rich white bread can now be bought in many localities in Canada. By the end of March, 1942, it will be generally available and will be called "Canada Approved Vitamin B White Bread." The corresponding flour will be called "Canada Approved Vitamin B White Flour." This new type of flour is the result of research carried out by the Nutritional Research Laboratories of the Department of Paediatrics, University of Toronto, and the Dominion Department of Agriculture, in collaboration with some of the milling companies. By reducing the amount of moisture in the grain and by altering the set of the rollers in the milling machines, these investigators found that they could retain much more of the B vitamins of the grain. Also they discovered that the newer types of hard Canadian wheat were much richer in these vitamins than the older varieties. By this process all of the vitamins and minerals that were originally present in the grain are well represented in the final flour. It seems a much more reasonable and economical process than that of removing all and then replacing one or even three of the many factors involved.

Most of the so-called whole wheat bread that is on the market contains at least 33% of white flour, as a loaf made exclusively of whole wheat flour is too heavy for most tastes. The new vitamin rich white flour can be made into bread as it stands. It is practically white in colour, and tastes like white bread. The amount of vitamin B1 in the various types of bread is shown in the following table:

Milligrams of Vitamin B1 per pound	
White bread	0.18 – 0.27
Canada approved Vitamin B white bread	.60 – .79
So-called whole wheat bread	.69

Most nutritionists estimate that an adult or child over twelve should eat approximately 1.5 mgm. of thiamin per day. How can we meet this requirement? The chart on the following page shows the amount of this vitamin contained in a well-balanced diet for an adult female:

If a small serving of a whole grain cereal, plus a tablespoon of wheat germ (or a large serving of such a cereal alone), and four slices of whole wheat bread are eaten, the requirements are easily met. If, on the contrary, corn flakes or farina, and white bread are eaten, not much more than half the daily requirements are obtained.

Wheat germ is a very rich source of thiamin, as it contains about 7.5 mgm. per pound (about ten times that of whole wheat bread). When serving it with porridge it should be added shortly before serving or sprinkled dry on the cereal, as prolonged boiling will lead to a loss of about 20% of its thiamin content. It

	Thiamin		
20 ozs. pasteurized milk	.34		.34
4 ozs. meat	.13		.13
4 ozs. cooked potatoes	.13		.13
4 ozs. vegetables (average of 6)	.15		.15
6 ozs. fruits (average of 3)	.08		.08
	.83		.83
½ cup cooked rolled oats	.16	1 serving corn flakes or	
1 tablespoon of wheat germ	.27	farina	0
4 slices whole wheat or vitamin-rich white bread	.30	4 slices ordinary white bread	.06
	1.66		.89
1½ ozs. sugar	0		0
1½ ozs. butter	0		0
	1.66		.89

is an excellent plan to incorporate it in tea biscuits, muffins, etc., using about one part wheat germ to three parts of white flour. The temperature inside the muffin does not go above boiling, so there is a loss of not more than one-fifth of the thiamin. Ordinary toasting leads to a loss of about the same amount; when bread is made into Melba toast all the thiamin is destroyed. This vitamin dissolves readily in water. If the water in which vegetables have been cooked is discarded, as much as 50% of their thiamin content may be lost.

Riboflavin

In the rat, a lack of riboflavin results in poor growth, ophthalmia, dermatitis and cataract. The role of riboflavin is apparently that of an oxidizing enzyme in the tissues. Recently a test has been discovered which elicits evidences of riboflavin deficiency in its early stages. When the eyes of an individual who has been eating a diet low in riboflavin are examined with a slit lamp, which is essentially a strong source of light plus a magnifying device, the capillaries in the conjunctiva, which normally are present in a narrow band around the limbus, are found to extend inwards into the cornea in several arcades. Such individuals often complain of eye fatigue, slight photophobia and lachrymation towards the end of the day. Headaches are usually frequent also. Therapeutic doses of about five times the maintenance dose rapidly clear up these symptoms. When the deficiency of riboflavin is more prolonged and severe, characteristic cracks and fissures appear about the corners of the mouth. Milk is a good source of riboflavin, and it is generally conceded that unless a pint of milk per day is taken it is difficult to meet our daily requirements. Riboflavin is destroyed by light, therefore it is a bad practice to keep bottled milk on a window sill or other light place.

Nicotinic Acid

In the southern United States pellagra is a common disease among the poorer classes. The diet of these people is very limited, consisting for the most part of the three M's—maize, molasses and meat. The latter is almost exclusively fat salt pork. These foods are very low in nicotinic acid. The symptoms of the disease are the three D's—dermatitis, diarrhoea and dementia. The only effective means of preventing the disease consists in drastically altering the diet. It is practically never seen in the Northern States or Canada. Our diets always contain enough nicotinic acid to prevent pellagra, but many of them contain less than the amount laid down as adequate. Very frequently individuals suffering from pellagra show signs of thiamin, riboflavin and pyridoxine deficiency as well.

Pyridoxine

Young rats fed a diet lacking pyridoxine suffer from severe dermatitis involving the extremities, nose, mouth and ears. The symptoms of severe pyridoxine deficiency in man are apparently great weakness and the inability to walk more than a few steps. When large doses of this vitamin were given to such patients their symptoms were relieved within twenty-four hours.

There is little doubt but that more members of this complex will be discovered and that others of them will be shown to be essential to human health.

PERITONEOSCOPY

By J. G. MICKLER and M. J. O'BRIEN, 4T2

This paper is presented in the hope of arousing interest in the possibilities of the peritoneoscope as an instrument aiding diagnosis. The authors do not pretend to be familiar with the details of technique or indications for the use of this instrument. They therefore invite criticism of the material set forth and hope to find the answer to their enthusiasm in the constructive criticism or suggestions received.

The peritoneoscope is an instrument devised for the express purpose of visualizing the various organs and structures projecting into the peritoneal cavity. This device enables the operator to examine these organs under direct vision through a small puncture wound of the abdominal wall. The whole procedure is carried out under local anaesthesia. The technique employed allows the observance of strict asepsis, and secondary peritoneal infection is extremely rare.

The study of the abdominal contents by such an instrument is by no means a radical recent development, since during the past forty years several investigators using various instruments have successfully carried out such a study. Ruddock has perfected a technique and an instrument which have enabled him to visualize the abdominal organs of more than 2,000 patients with exceedingly few misadventures.

Instruments and Techniques

The instrument used by Ruddock consists of:—

1. A sheath of light metal, lined with bakelite, fitted with a lock at its extremity and a stopcock at the side, near the end.
2. A bistoury-tipped obturator, which fits and locks into the sheath.
3. A telescope, made to fit the sheath. This gives a high degree of light and a large field with the smallest possible magnification.
4. A special rongeur-tipped forceps for securing biopsy specimens through the sheath.
5. A fluid evacuator.
6. A small needle trocar for instituting pneumo-peritoneum.
7. A special Rehfuss tube equipped with an electric light, providing illumination of stomach and bowel from within.

In brief, the technique employed is as follows:—

The patient is prepared precisely as for laparotomy, including preparation of the abdomen, draping and pre-operative sedation. The instruments used are sterilized, of course. The site of puncture is selected and anaesthetized by infiltration with novocaine. A small stab incision is then made to admit the sheath. (The most useful site of puncture is a point just below and to one side of the umbilicus.)

The pneumo-peritoneum needle is then introduced into the peritoneal cavity and the abdomen distended with air pumped gently through the needle until the abdominal wall is quite tense. The needle is then removed and the sheath and enclosed obturator are inserted by a quick jab into the peritoneal sac.

The obturator is then removed, the telescope inserted in its place, and any fluid present is withdrawn by the evacuation apparatus. Fluid thus removed is replaced with air to maintain distension. The telescope is then used to explore the abdominal cavity.

By changing the position of the patient and thus displacing the intestines, a full view of the organs may be obtained.

The examination should be done with a fixed plan in mind. First, a general exploration of all organs is made, before diseased structures are examined more carefully. The practice obtained by a few examinations enables ready recognition of the various disease states.

Peritoneoscopy visualizes the surface of organs projecting into the peritoneal sac but does not penetrate to the depths of a viscus.

For purposes of diagnosis, biopsy specimens may be obtained through the sheath under direct vision. These, of

course, should not be taken directly from the tissues of a hollow viscus, an abscess or a cyst, to avoid perforation or the spread of infection. The tip of the biopsy forceps, when closed, is so arranged that it forms a cup containing the desired tissue, while the closed tip acts as an electrode for coagulating the resulting wound; the biopsy material is not affected by the coagulation current.

With the use of high frequency currents it is possible to cut and coagulate tissue so that adhesions may readily be severed, but only when these are situated not between loops of bowel, but are attached to liver or abdominal wall.

Drainage of liver abscesses or ovarian cysts may be accomplished by means of a needle inserted directly through the abdominal wall, directed by observation through the peritoneoscope.

Other examinations, as of bowel and stomach, are facilitated by distending the viscus with air, and transillumination by passing the lighted Rehfuss tube.

Possible Complications and Accidents

The most important of these is perforation of a hollow viscus. This accident can be avoided by careful examination of the patient prior to attempting procedure, and by selecting the point of puncture to avoid all abdominal scars and possible underlying adhesions between abdominal wall and bowel. A bistoury plunger with a dull tip must be used, and the trocar should not be inserted in the presence of a full bladder. The abdomen must be well distended with air.

Hemorrhage following the taking of a biopsy may be obviated by careful coagulation of the site of every specimen taken.

Selection of Cases

Cases of an acute inflammatory nature should not be examined, nor should suspected ulcers of stomach or duodenum, for the X-ray provides a reliable method of examination of the latter.

Peritoneoscopy is also contra-indicated in obstructive lesions of the small and large bowel, paralytic ileus and dilatation of the stomach, because of the great danger of perforation.

Chronic cases should be selected, and emaciation, age, anemia, albuminuria, diabetes or deep jaundice are not contra-indications.

In our opinion, therefore, peritoneoscopy lends itself admirably to the study of various types of liver disease and the corroboration of suspected ectopic pregnancies, and various other chronic or non-inflammatory conditions affecting the female pelvis, namely: ovarian cysts and tumors, malformations, fibroids, etc.

The operability of gastric carcinoma may be determined by noting the presence or absence of liver metastases, peritoneal spread and the degree of invasion of the (internally illuminated) stomach. Malignant peritoneal metastases and chronic gall-bladder disease are readily recognized by this method and the cause of unexplained ascites may be determined.

The Value of the Method

The value of peritoneoscopy lies in the ease of application and the differential diagnostic possibilities obtained through the use of this direct eye-controlled method of examination. An idea of the accuracy of the method may be gleaned from the fact that in the first 900 cases examined the average clinical accuracy was 61.4%, whereas the peritoneoscopic accuracy was 93.6%. (In cases of tuberculous peritonitis, peritoneal metastases, cirrhosis and malignancy of the liver and ectopic pregnancies selected for statistical study.)

Peritoneoscopy is a minor procedure under local anaesthesia, entailing practically no discomfort, with minor economic features, while a diagnostic laparotomy is a major procedure involving a general anaesthetic, and is followed by a prolonged recovery period. In addition, exploratory laparotomy carries an operative mortality risk of 6% (Lahey), while that of peritoneoscopy, in the first 900 cases of the 2,000 cases examined, was 0.11%—a stringent observation!

Conclusions

The preceding material should indicate that peritoneoscopy should be seriously considered as a valuable diagnostic

aid in various chronic inflammatory and neoplastic conditions, affecting the abdominal organs. It should be particularly useful in gynecological conditions, such as ectopic pregnancy or ovarian tumors and cysts.

Obviously, this procedure cannot replace exploratory laparotomy in all instances, but in view of the much lower operative risk, and the comparable results obtained in many conditions, peritoneoscopy should be employed more often.

The authors are most grateful to Dr. J. C. Ruddock of the University of Southern California for furnishing them with material upon this subject, and for a resumé of the results he has obtained as the leading exponent of peritoneoscopy.

MENTAL DISORDERS IN THE ARMED FORCES

By JOHN ARMSTRONG, '43

It is obvious that everyone is not suited for military service; many cannot stand the stresses imposed by war. "Not all persons are adaptable to restrictions and inhibitions of personal desires and comforts, to deprivation of rest, food or shelter or to the extraordinary demands for prolonged physical and mental activity often imposed by active military service. Many persons with abnormal personality traits who are capable of satisfactory adult adjustment in civilian life in which numerous avenues of escape are available will be at a total loss to adjust themselves to a pattern which is more or less inflexible and, of necessity, delimited and circumscribed as to self expression."*

History

Medical examination of recruits for military service was begun in 1726 in France, and was soon adopted by other countries. But medical care of the forces was sadly lacking, for as late as the Spanish-American War, 1898, more men died of disease than were killed in combat. The story is told, for instance, that a medical officer complained of a certain water supply being contaminated with typhoid. The O.C. tasted it and declared it suitable for use; a few days later the pump was found broken. The same ignorance and prejudice existed with respect to neuro-psychiatric conditions of the first Great War, 1914-1918. In the British Army, 1917, one-seventh of all discharges were due to nervous and mental diseases, or more pertinently, one-third of all discharges, barring wounds. Even in the United States at this time, having two and one-half years of experience to be learned from European countries, judges would drop charges of theft, petty larceny, forgery, and so forth, so that the accused might enlist in the Army or Navy. The armed forces is no place for such undesirables, as I shall try to point out; if a person cannot adjust himself to civil life, he will be far worse in the military services under the strain of regimentation.

The British Army mental hospitals in 1917 contained many mentally deficient, some of whom had been civil and criminal offenders before entering service. There was a considerable number of syphilitics, 20% were manic-depressives, most of whom exhibited symptoms prior to enlistment; 14% schizophrenics, again most showed previous symptoms, and 7% epileptics, all of whom had previous symptoms. Again, in July, 1918, 3,035 men of the American Expeditionary Force were sent to Europe, and were recommended as mentally unfit for military service prior to departure.

This may help to explain the old adage, "military life is the touchstone of insanity."

But even in the present war over 30% of the Canadians returned home from service in the low countries were discharged due to nervous or mental disorders, and in the Empire Air Training Plan, there were, a short time ago, some 30-35% washed out or temperamentally unfit as they were technically known, before reaching their Service Flying Training Schools. The great majority, perhaps 80% of these were due to mental disorders. This figure is, I believe, being substantially reduced at the present time, partly through the greatly increased importance attached to certain E.E.G. findings.

The first report of mental disorders in wartime was found in the Russo-Japanese War, 1905, when considerable use was made of heavy artillery fire. The Great War was marked by great expansion of artillery, bombing, gas attacks, machine guns from aeroplanes, etc., each of which precipitated many more mental diseases. And today with greatly increased tempo and intensity by means of panzer divisions, dive bombers, parachute troops and high explosives, this problem becomes the more acute.

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*Neuro-psychiatric Examinations of Applicants for Voluntary Enlistment and Selectees for Induction, Circular Letter No. 19, War Department, Office of Surgeon-General of the U.S. Army, March 12, 1941.

Psychiatry has always laboured under considerable difficulties and general disrepute. Perhaps this is due to its being intangible, dealing to a large extent with theoretical concepts, and there exists none too great co-operation and recognition between the various workers in this comparatively young field. At the beginning of the last war, traumatic and war neurosis were thought due to organic change, "Shell shock" was thought due to head injuries, concussions and so forth, though actually head injuries very rarely show evidence of psychiatric changes.

"Effort syndrome" was described as due to "long continued physical effort under unfavourable conditions with ultimate breakdown," by Sir Thomas Lewis, and is still described as such in the second edition of his book, "Disease of the Heart", 1937. In the United States the name was changed to "Neurocirculatory asthenia", which may be found in the text books, but means as little.

In refutation of such a viewpoint, in Massachusetts camps in 1917 typical "shell shock" and "effort syndrome" examples were found within a few weeks of enlistment, yet the recruits never saw a shell and the training was by no means strenuous.. Again, 2,100 out of 2,500 shell-shocked U.S. soldiers awaiting transportation from England in 1918, recovered in a day or two after armistice was signed. Surely nothing could be more clear cut.

Types of Mental Disorders

A brief summary of the main types of mental disorders found in wartime will now be considered.

1. Mental Defects and Deficiencies are displayed by inability to learn, reason, and calculate; defective judgment and foresight; suggestibility; muscular awkwardness.

2. Psychopathic disorders are present in those with no intellectual defects but who fail to properly adjust in an adult manner to social demands of honesty, truthfulness, decency. They are emotionally unstable, acting on the impulse of the moment, exhibiting poor judgment, and inability to profit by experience. They have little perseverance and are easily influenced.

They exhibit a recurrent asocial conduct, conflicting with the law. They dislike authority and have a bad influence on others, inculcating insubordination.

Society has machinery for the treatment of the so-called insane on the one hand and the frank criminal on the other. But the psychopath falls in between and frequently, by accident, falls into the hands of one or other group. They are the pathological liars, vagabonds, petty offenders, swindlers, klepto-maniacs, pyro-maniacs, and the like.

3. Major Abnormalities of Mood — these patients show episodes of unreasonableness in response to stimulus, or in the duration of elation or depression, which may be cyclic in character. Either one or both moods may be present, as in the manic-depressive. Their judgment is usually seriously impaired, and in the extremes of either phase are totally inadequate for any duty, as they frequently lose control of their personal hygiene and sphincter control and may have to be fed by hand. There are all degrees, for instance, hypo manics—the braggard in the pressure of activity, irritability; and the mild depressive with lack of spontaneity, self-deprecation, loss of weight.

4. Psycho neurotics take three main forms

a. Anxiety States, formerly called neurasthenics, characterized by over-reaction in the situation or set of circumstances in which there are bodily symptoms, such as fatigue on slight exertion, irrespective of the amount of work or the muscular tone of the body. It may be quite unaffected by long rests in bed. They may have local symptoms relating to kidneys, genitals, circulation; a special example is the development of phobias.

b. Hysteria, who under reacts by paralysis or convulsions, or at least loss of function. The milder forms are experienced by everyone, such as stage fright, headache from anxiety but the normal never experiences amnesia, fugues, somnambulism, or trances.

c. Obsessional compulsive phenomena, exhibited by rituals of conduct. An obsession is a persistent irrational thought

which the patient knows is irrational but cannot expel from his mind.

None of these is a water-tight compartment, for as all are due to similar causes, some painful experience, the symptoms may overlap considerably. Such a classification only aids in understanding the reaction in terms of treatment. The general symptoms may be cutaneous anaesthesias, paraesthesias or hypochondriasis.

Also under this heading may be considered the most recent of psychiatric studies, psychosomatic medicine, in which personality changes are manifest in symptoms and signs of systemic disease. These may simulate disease of almost any organ system, but most frequent are:

(a) GI tract—gastric or duodenal ulcers, pyloro-spasm, spastic colon, mucous colitis, even ulcerative colitis;
(b) Cardiovascular—tachycardia, hypertension, extra systoles, distressing cardio vascular consciousness;
(c) Urinary—frequency, urgency, even bed-wetting (which is more dishonourable than GI circulatory, or muscular symptoms frequently causing secondary reactions of isolations, habits and rituals);
(d) Neurogenic—tics and tremors;
(e) Muscular—paralysis, pain, atrophy;
(f) Allergic—asthma, urticaria;
(g) Peripheral (autonomic)—less important, irrelevant blushing, flushing, lacrimation, salivation and so forth.

5. Schizophrenics show obscurely motivated peculiarities of behaviour and thought. The symptoms are fairly characteristically those of—

(1) Hallucination,
(2) Supernatural communication,
(3) Apathy and withdrawal,
(4) Ideas of persecution and reference,
(5) Grimaces.

Two varieties may be described—

(a) Deteriorated States — shiftlessness, untidiness, perhaps morose, nomadic;

(b) Paranoid — fantastic beliefs of importance with persecutory ideas of career and well-being; in some, in communion with supernatural powers; in others, victims of spy rings, plots.

Some of these patients are evasive and skilful in concealing their disorder, which is developed through a clever misrepresentation of facts. They are very suspicious of anyone taking an interest in them, are hateful of interrogation, particularly questioning on intimate matters, which may cause embarrassment, confusion or even blocked speech.

6. Chronic Inebreity—

(a) Alcoholism, suffused eyes, prominent vessels, particularly in the nose; flabby cheeks, tremors, tongue and hand emotionalism, prevarication, suspicion, persecution.

(b) Drug addiction, pallor and dryness of skin, during use, flippancy, mild exhilaration, withdrawn, cowardly, weakness, pains.

All are pathological liars who do not drink and are usually sexually inactive. Scars of needles are frequently to be seen all over the surface of the body.

7. Neurosyphilitics — pupil changes, Argyll Robertson pupil, speech defects, slurring and distortion, apathetic, depressed or euphoric, neurological findings.

8. Other Organic Diseases — post encephalitis, muscular dystrophies, multiple sclerosis, epilepsy.

All writers on the subject stress the fact that no mental disorders appear in wartime that are not present in the civilian population during peacetime. Thus in the United States 20% of the beneficiaries of the last war in June, 1940, were mental cases, and 19% of the peacetime army and navy beneficiaries of 1939 were also mental cases. A standard proportion.

Incidence

The incidence of war mental disturbances is found chiefly at three periods:

(a) Mobilization,
(b) During action,
(c) Demobilization.

(a) During mobilization in the U.S. A., 1917—9% of the first million men were rejected, or 90,000 men, and 12%

of all rejections were for nervous or mental disorders in the ratio: mental deficiency, 32%; neuroses, 15%; psychoses, 11%; organic disease and head injuries, 10%; epilepsy, 9%; psychopathic, 9%.

British figures for mental deficients varied from 30-42% in different series.

(b) According to Farrar 10% of all totally disabled Canadians during the war were mental disorders, of which neuroses 58%, mental disease and deficient 16%, epilepsy 8%.

These figures were corroborated in other surveys.

This demonstrates one very interesting fact which was also found by Birnbaun in Germany, 1915, that those who broke down during mobilization were chiefly psychotics — manic depressives, schyzophrenics and also psychopathics, whereas those who broke down in action were chiefly neurotics—anxiety states — hysteria—obsession and compulsive states. Also it was found that in action mental illness was rare amongst the seriously wounded, but a minor wound might give localization to a hysterical disorder.

(c) Cessation of war brought the figures back to pre-war proportions. The most dramatic illustration has been already cited, how 2,100 out of 2,500 shell-shocked Americans awaiting transport to the United States recovered in a few days after Armistice.

In the United States during 1930, 27% of the War Veterans' Administration beneficiaries were neuro psychiatrics, of which 66% psychotics, 19% neurotics, 8% epileptics, 8% organic, 2% mental deficients.

Of the psychotics the schizophrenics were by far the more common, as manic depressives tend to recover over a period of perhaps years, whereas the former do not.

It is interesting that neuroses are rare amongst prisoners of war. One figure quoted 5 in 40,000.

Some of the factors bearing on the development of mental symptoms may bear mention. For instance:

(a) In enlistment, in camp, separation from home, regimentation, prohibitions necessary for mass training, changes of habit routine, sleeping and eating.

(b) In active service, expectation of action, strongly averse; conflict of killing, contrary to all education in civil life; whereas it then carried with it threat or actual punishment, now it is glorified, in fact it is the aim of the whole training scheme; fear of action of which enemy makes great use by means of whistling bombs, terrifying tales and horrible examples, and also threats in advance of actual combat.

Trench or static warfare, perhaps a thing of the past, also has its psychic factors in—monotony

—lack of sanitation

—fear of death or deprivation of food

—poor sleep and general fatigue.

The cost of caring for neuropsychiatric disorders is stupendous. The United States through the War Veterans Administration has paid out over one billion dollars in the last 15 years for pensions and hospitalization, and this by no means represents all that has been paid in the U.S. alone. They create a very real problem because as has been said 20 odd per cent of the beneficiaries were mental cases but over 50% of the hospitalization is for mental cases of whom 66% are psychotics who remain in bed the longest—much longer than most physical diseases.

There is, however, one excellent means of attacking this problem for of that one billion spent 90% of the cases had a history of mental disease prior to enlistment. The facts are these (1) the majority break down soon after reaching camp, (2) most have a history of symptoms prior to enlistment, (3) majority have a family history of mental disease.

Thus in the U.S.A. surveys:

	Personal History Prior	Family History
Neuroses	95%	55.1%
Psychoses	87%	50%

Commander Stearns of the U.S. Navy after a survey claims that persons with nervous or mental disease are sixteen times as likely to be invalided home as those with physical disease.

Initial Examination

The problem then resolves itself into one of adequate initial examination, which means some sort of personal and family history. Dr. Alexander Simon of the St. Elizabeth's Hospital in Washington where all those that the various state departments refuse to look after, are relegated if they have no private means, suggests the following sample questions:

1. Has he been treated for nervousness?
   —nervous breakdown
   —in mental hospital or sanatorium
2. Has he ever had fainting spells?
   —spasms
   —fits
   —convulsions
   —falling out spells
3. Has he ever been arrested?
   —detention home or training school
   —reformatory
   —jail—for what?
4. Does he drink?—how much—how often
5. What grade did he reach in school?
   —at what age
   —did he repeat
6. What is his occupation?
   —how long on one job—how many
7. Has he a close relative, parent, brother, sister, aunt or uncle, with nervous breakdown?
   —patient in hospital for mental disease
8. Are his parents living? together?
   —how old when one or other died?
   —when separated or divorced?

There is provision in the "Physical Standards and Instructions for the Medical Examination of Recruits for the Canadian Active Service Force" for inquiry into the recruit's education, previous occupation and surroundings. But this has been frankly ignored. "The majority of medical officers acknowledge that no endeavour is made to estimate the recruit's mental capabilities." (Baillie).

In the U.S. at present, a local board examines all recruits, or as they call them "selectees", and any in whom there is the least suspicion of a psychiatric disorder, is referred to a special psychiatric board.

The purpose is to eliminate such personnel before they quit their job, and say their fond adieux, only to arrive back home a few weeks later. This helps to eradicate the stigma attached to army rejection. After all, the armed services today are a temporary vocation requiring certain definite aptitudes and if a man is not suited to the army that does not mean he cannot carry on in civil life, otherwise it tends to undermine civilian morale.

As has been so often said of the Air Force, there are 10 men on the ground for 1 in the air; so in the war economy of today, there are 10 men at home for one at the front.

Thus elimination of inadequate men from the armed forces is essential because they are

(1) a menace to discipline and esprit de corps
(2) an undesirable burden on the medical corps of a fighting unit
(3) an unnecessary expense to the state in the following years.

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Feature Section

J. B. ROBERTS, Editor

INDUSTRIAL HEALTH

By J. CUNNINGHAM, M.B.
Director, Division of Industrial Hygiene, Department of Health, Ontario

While the war is yet to be won the tremendous responsibilities of the leaders in democratic countries include consideration of post-war conditions. When our energies now concentrated on the defence of freedom, so long taken for granted, can be safely directed to peaceful pursuits a much wider application of existing knowledge may be expected. Nowhere is this more desirable than in the prevention or control of disease and defect. Industry is favourably situated to accomplish much for adults and has sufficiently demonstrated what can be done by suitable medical personnel.

For any discussion of industrial hygiene or industrial medicine orientation is necessary at least respecting the use of terms. In the last analysis all health of persons is a matter of public concern whether affected by an unsanitary condition, a communicable disease, delayed care in malignant disease, or inadequate facilities for the care of sick people generally; and this interpretation of the field of public health is accepted, if not always acted upon, by governments representing the population.

An individual with a major defect may look upon it as something to be remedied or not as he sees fit, but when forty per cent of volunteers for the armed forces are found to be unfit for general duty, the public health is involved. The information acquired on what condition of health exists and the application of the remedy, lie with the practice of medicine and hygiene.

Hygiene is the science of the preservation and up-building of health, covering sanitation which deals with environmental considerations, and preventive medicine which is more directly concerned with the personal aspect of health. It is through the practice of preventive medicine that hygiene and curative medicine are linked. Indeed, if medical practice is to retain the patient's confidence, they are inseparable. Epidemiology and also the control of occupational diseases have the same close relationship to general medicine as have obstetrics, surgery or pediatrics.

Diagnosis is common to them all, and while nothing is expected to take the place of clinical acumen, there is involved to an increasing extent, the utilization of accessory facilities, not available to the individual physician except through public assistance, such as hospital accommodation, laboratory or x-rays, and these are directed as much to prevention as to cure. Daily, in the practice of medicine, measures are invoked to prevent or to control sickness and particularly to lessen the possibility of complications or permanent disability arising. In establishing diagnosis inquiry is made in suitable cases regarding the water or milk supply, personal health habits, occupation, resistance to disease. In the ordinary course of treatment, infection in surgery, eclampsia in pregnancy, malnutrition in infants and maternal mortality are prevented or controlled, but it was not always so. Progress has been made and this progress represents an advance toward the time when prevention will dominate medical thinking without detriment to treatment.

The Medical Act, the first important public health legislation, provided for the training and licensing of physicians to care for the health of the people. Its enforcement was placed in the hands of the profession itself through Colleges of

Physicians and Surgeons. As the causes of disease became better understood, the second health legislation was directed toward sanitary measures which required community action and a staff to enforce it. Then followed quarantine for communicable diseases and improved vital statistics which help to define the problem. The activities of law enforcement agencies were extended to deal with the facts uncovered—high infant and maternal mortality, diseases of a communicable nature like diphtheria and tuberculosis and those due to dietary deficiencies. Because the remedy so often lay in personal rather than in community action and the enactment of legislation rested ultimately with the public, the program became educational not merely for population groups but directed to the individual in the light of personal needs. To meet this need, clinics for the different age groups came into being—well baby, pre-school, school, and industrial. As soon as the public is able or willing to seek the advice of the family physician early or regularly the need for organized facilities of this kind disappears and this should be the goal. Its realization, however, depends on the efforts of the physician himself.

The family physician should be the centre through which all health agencies function, but to accomplish this he must approach the care of his clientele partly from the standpoint of the social implications of the problems presented to him—*why* is this child undernourished?—where did this tuberculous patient receive his infection??—if this workman has lead poisoning very probably others employed with him are affected.

It is because there is an opportunity to widen the application of existing knowledge in this direction, that this opportunity is inherently greater in industry than elsewhere and it is because less has been done about it, that industrial medicine must grow. Large groups of apparently well persons readily accessible to the practising physician for the early detection of disease and defect, present a challenge for the control of ill-health which is not limited to employees, but which extends in its influence to the women and children at home.

The nature of the medical problems encountered in industry requires two types of service complementary to one another, directed to industrial health. The American Medical Association has placed consideration of the subject in the hands of its "Council on Industrial Health". In one of these, "Industrial Hygiene", environment and its effects predominate, and here the physician, engineer and chemist have an important contribution to make. In the other, personal health occupies first place and this involves the practice of industrial medicine, which, however, would be incomplete without the physician's regular attention to conditions of work. The two are intimately related. Indeed, in either case he must learn something of industry itself so that his technical advice will take account of all factors involved and that the employer and the employee will recognize that such is the case. For example, it may not be practical to substitute for dangerous materials, or wear protective clothing, or provide a "light" job.

The industrial hygienist, familiar with procedures for the maintenance of general health requires also to be able to evaluate the conditions of work as they affect health, and to make corrections. Special facilities in personnel and equipment are necessary for the investigation of the effect of altered physical conditions under which work may be carried on, e.g., temperature, humidity, air pressure, speed of operation or exposure to toxic substances. Sixty-five per cent of employees are in factories with less than five hundred persons, so that these facilities are not available to most plants except as provided by a central agency such as a Health Department. No longer is it sufficient to say to industry, "This condition should or must be corrected". It is necessary to give the reason and to assist in a solution, partly to gain the intelligent co-operation of workmen themselves.

Research studies during and since the last war have established that good conditions of work in industry are economically sound, since such conditions favourably influence the amount of sickness, accidents, spoiled work and output so that employers are more readily able to justify expenditure for this purpose.

While the cost of occupational diseases under Workmen's Compensation Acts is only about one per cent of the total cost of industrial accidents, the industries which *are* affected by the important occupational diseases carry a heavy burden, so that the control of conditions of work receives their attention. In times when work is plentiful employees naturally choose factories with good working conditions, which reduces labour turnover and improves industrial relations. For these and other reasons, the demand for this type of assistance is increasing although the number of trained industrial hygienists likely to be employed in Departments of Health in Canada is strictly limited.

"Industrial medicine", the second approach to industry's health problems, emphasizes personal health and requires both a knowledge of the physical and mental condition of employees and of job requirement in order to assure adequate placement at work. The conduct of periodic physical examination for the early detection of disease and defect, health education, the rehabilitation of the worker after absence from sickness or accident, and usually the treatment of industrial accidents and occupational diseases; all are the responsibility of the industrial physician. Industrial medicine is practised inside the plant and usually paid for by the employer. The size of the plant is no limitation, although the number of full-time physicians for this purpose will be few in this country. Because of the small number of very large factories, most of this work will be performed on a part-time basis by the practising physician for the average or small-sized plant. It was surgeons associated with industry, because of the employer's liability for industrial accidents, who, thirty years ago, first drew attention to the enormous waste in industry from general sickness—ten times as great as that due to industrial accidents. It has been demonstrated sufficiently since then that health supervision is effective in reducing this waste. The situation is in no way met by the common arrangement whereby the physician is on call in case of accidents or other emergency. To date, too many industries have not seen its value or do not realize that a health problem exists. However, rapid expansion is in sight, so that it is important that physicians recognize that no new medical specialty is involved, but rather that a point of view must be acquired which recognizes two things:—first, the need of industry to reduce the loss caused by sickness and disability, and second, that this cannot be accomplished except through the practice of preventive medicine. This point of view seems often to be acquired with difficulty. It involves some knowledge of relationships within industry, objectives to be attained, governing legislation, and a desire to maintain high professional standards of work. With employers and employees convinced of its value, physicians in general practice associated with industry report lasting satisfaction from their endeavours in this field. The physician who encounters the wage-earner only as a private patient also has an obligation to know what his work involves in effort and exposure.

One contributing factor to more wide-spread action on the part of industry lies in the increasing demand of employees for coverage for sickness. Benefit associations are being established even in new war factories. Group health insurance is common. The workman is more immediately interested in receiving treatment when it is needed, but usually industry contributes to these arrangements and then wishes to know what measures for preventing sickness will reduce the cost. The same condition might be expected to prevail on a wider scale if some form of health insurance were adopted. The response of employees to any effort by industry to control sickness has been immediate. The demand for maximum output and conservation of labour for war purposes has focussed more attention on preventive measures.

In Great Britain, within a year after the war began, legislation required that physicians and nurses be employed in war industry, not for the treatment of disease but for the supervision of health. Since then, the number of industrial physicians has greatly increased in spite of a general shortage of physicians for all purposes. Such action has not been taken in Canada but any practising physician in an

industrial community should be prepared to undertake this work and to discuss the subject when it is raised by the employer, furnishing him with adequate guidance or directing him to the source of information in respect to a technical subject, such as he requires where chemical or engineering problems are encountered in factory operation. The lack of such guidance has resulted in the development of inadequate or entirely unsuitable medical arrangements in a number of instances when the employer had reached the stage where he felt some action might be taken.

The British Medical Association in 1937 outlined ethical rules for the guidance of industrial medical officers in dealing with outside medical services and last year, set up a special committee which has just issued a report, part of it outlining the place of medicine in industry and defining the duties of an industrial medical officer. Here, once again is emphasized the fact that the family physician, even without any specific industrial contact should know as much as possible of the influence of industry on health for prevention and rehabilitation. It may be noted that the presence of National Health Insurance in Great Britain has in no way detracted from the extension of industrial medicine.

The American Medical Association through its Council on Industrial Health, established in 1937, has investigated the many problems relevant to health in industry, and has made recommendations for the guidance of those interested. The activities of this Council through State and County Medical Societies have been valuable in demonstrating to industry the importance of health supervision and in furthering the training of personnel.

The Canadian Medical Association has likewise recognized the growing importance of this aspect of medical practice in establishing its Committee on Industrial Medicine. Naturally at the moment attention has centred on war industry, but the approach to the subject in all these countries contemplates the expansion of industrial health activities beyond immediate needs into the post-war period.

Abstracts

D. P. BRYCE, Editor

Contributors { J. G. Mickler
R. J. Wilson
G. G. Caudwell

Chronic Fatigue Symptoms Among Industrial Workers

R. VANCE WARD, M.D., C.M., F.R.C.P.(C.)

Can. Pub. Health Jour., September, 1941
Vol. 32, Page 464

Observations on the most common symptoms noted among 1800 industrial workers and resulting in absence from work and payment by a sick-benefit system are described. Because of the similarity of the symptoms in almost every instance, it became the custom to take a careful history and to do a thorough physical examination including a chest X-ray if at all possible.

Nearly all the cases were among young girls, and 80 per cent occurred between May 1 and September 30. All brought letters from their family doctor requesting one or two months' leave because of one of "weakness, debility, general debility, nervous debility, depression, general depression, nervous depression, nervous breakdown, asthenia, neurocirculatory asthenia, anaemia, fatigue, run-down condition". When the plant was forced to work overtime the number of cases increased to as high as four per cent of the personnel. There were more in years of prosperity than in years of depression, more in the seasonable months than in the winter.

Three possibilities were considered:—

1. The patient was malingering for the purpose of obtaining a long summer holiday.

2. There might be serious chronic organic disease present, such as tuberculosis.

3. These were true symptoms, functional rather than organic in nature. The third possibility was the one borne out on analysis of the symptoms and the physical findings. Nearly all of the patients complained of all, or of more than half of the following symptoms.

1. Fatigue. They stated that they awoke in the morning just as tired as they were when they retired at night.

2. Pain in the back, on the right side between the scapula and vertebræ. This occurred in nearly one hundred per cent of the cases.

3. Loss of appetite.

4. Inability to sleep until the early hours of the morning.

5. The women tended to cry a great deal over nothing.

6. The men were irritable.

The main physical findings were:—

1. Loss of weight.

2. Increased pulse rate, usually over one hundred beats per minute.

3. Low blood pressure.

4. Tremor of the outstretched hands.

5. Pallor

The three main diseases that are most easily confused with this "fatigue syndrome" and which were always borne in mind were (1) pulmonary tuberculosis, (2) hypochronic anæmia, (3) Grave's disease. Pulmonary tuberculosis was eliminated by absence of clinical findings and X-ray of the chest. Hypochronic anæmia was eliminated by haemoglobin estimations. Most of these cases had a haemoglobin of sixty-five to seventy per cent. Hyperthyroidism was more difficult to exclude and in some cases basal rates were done and all varied from minus one to plus five.

Treatment was almost entirely confined to advising a proper holiday.

There was a tendency to recurrence in certain persons more than in others. It is considered that the increase in the rate of production in industry, taxing the working capacity of the individual is chiefly responsible for these conditions.

R. J. Wilson.

Coronary Artery Disease Analysed Post-Mortem

Gordon BLAND and WHITE.
BOSTON A.H.J. 17. 10

This study was carried out with special reference to economic status and sex.

In young adults the men with significant coronary disease outnumbered the women 3:1. In middle age the ratio was still 2:1 but over 70 years there was no significant sex difference.

By careful methods to ensure the results to be of statistical significance it was shown that the general level of atherosclerosis in private patients at all age groups was consistently greater than those from the general wards. The most striking difference was between the ages 41 to 60 where the incidence among private patients was twice as great.

D. P. B.

Why Inguinal Hernias Recur

ROBINS M.D.

Annals of Surg. July 1941

The basis for this paper lies in the statement that hernias, especially the direct variety, recur because of an actual muscle deficiency which no repair of the canal can correct. Usually the conjoint tendon inserts into the crest of the pubis and the iliopectineal line, but with hernia this part of the muscle is likely to be absent. This deficiency may be determined by invaginating the scrotum so that the finger slides over the pubic crest and into the abdominal cavity. If the flat muscles are only sutured to the inguinal ligament then this space is not obliterated and there is recurrence. Also ordinary suture must be applied under tension and then approximate attenuated edges only; both these conditions are likely to lead to failure of closure. By the use of fascial sutures which approximate the Rectus muscle to the pubis by passing through the legamentous covering of the anterior surface of the bone, the above difficulties are avoided and the best possible assurance against recurrence obtained.

D.P.B.

Treatment of Acute Nephritis

MURPHY and PETERS J.A.M.A. 118, No. 3

The authors present a series of 205 patients in an effort to assess the factors in treatment which affect the prognosis. They found that 41% of the patients were completely healed, 12% died in the acute stage, 9.2% entered the latent stage, and 27% became chronic.

The clinical manifestations were to be in order of frequency:

(a) Urinary changes which are always present often with no other signs.

(b) Edema in 50% and when it occurs in the early stage it does not carry an unfavourable prognosis.

(c) Hypertension in 35% and it was definitely a discouraging event. When it occurred in the latent stage complete healing did not result.

(d) Elevation of the N.P.N. in 33%. It has no significance in the first week, but if it rises after this, it indicates the kidneys are not doing so well.

(e) Genuine uremia occurred only twice. Convulsive seizures are independent of uremia and are dependent upon cerebral edema, usually precipitated by hypertension. With development of uremia, recovery is rare.

After the acute stage there is a period of indefinite length in some patients, in whom urinary findings indicate active inflammation. It is in this period that in many cases the prognosis is formulated and therefore that proper treatment is so important. The authors believe that a

combination of tests repeated frequently give the most significant information in this period. These are:

1. urinary findings.
2. renal concentration tests.
3. blood urea clearance test.
4. any anemia present will indicate by its course the condition of the kidney.
5. plasma protein estimation.
6. sedimentation rate.

The treatment in this period must be physical rest in bed with a diet of protein 0.75 to 1.0 grms/kilo per day, simple restriction of NaCl., avoidance of excesses in fluid intake, adequate vitamins, iron therapy, which combined with treatment of infected Foci, they believe to give the best results.

They found that the ultimate prognosis did not depend on the severity of the acute attack and that in general it was not as favourable as is usually supposed.

D.P.B.

Pneumonia Treated at Home

Annotation in *The Lancet*, December 20, 1941.

The value of chemotherapy in pneumonia is well authenticated from the records of patients treated in hospital where the diagnosis may be confirmed by pneumococcus typing and X-ray, the treatment controlled by laboratory tests and the progress continuously observed. Quite a different picture is presented however in the home where only a few of these measures are possible. Nevertheless, because of the ease of administration of the sulphonamides and the ready response of the patients to such chemotherapy, an increasing number of cases are being treated in the home so that such treatment should be efficient and safe.

Unfortunately the sulphonamides are toxic drugs, capable of producing anuria from too high a concentration and insufficient fluid intake or granulocytopoenia from too persistent treatment. However the reverse is also true where over-cautious administration of the drugs, or stopping the treatment too soon may allow the infection to smoulder on or the occurrence of relapses after apparent cure. Treatment with either sulphapyridine or sulphathiazole should aim at moderation especially when given in the home. It has been found that there is no difference in the response of pneumonic infection to blood concentrations between 2 and 15 mgms% of these two drugs and further a total dosage of 25-30 gms. was quite sufficient to control most pneumonia. It is suggested that the initial dose should be 2 gms. of sulphapyridine or 3 gms. of sulphathiazole followed by 1 gm. every four hours for the next two days and 1 gm. every six hours for the next three days. Because of the ease in which sulphathizoale is excreted and so a difficulty in maintaining a satisfactory blood level, this drug is given in four hourly doses day and night.

Although it has been suggested that chemotherapy sounded the death-knell of pneumococcus typing, this procedure however gives valuable information not only in diagnosis but in prognosis and further presents useful epidemiological data.

A recent survey conducted by the Department of Health of Ontario, in domiciliary practice which were typed by those investigating the pneumonia in the department, found that the average amount of the sulphonamides given was 18.4 gms per case, there being a distinct tendency on the whole not only to give too little drug but also to terminate its administration too soon.

G.G.C.

The Present Status of Surgical Procedures on the Biliary Tract

ROSCOE R. GRAHAM

Texas State J. of M Sept 41

The author presents a short history of surgery in this field, stressing in particular the value of the Graham-Cole dye test. In the TGH there has been shown a 99.1% accuracy in the results

of the X-ray exam, and stones were shown in 61% of the cases in which they were present. These figures, however, depend upon the accuracy of clinical diagnosis also, because the group in which the dye test is done are selected.

The most important factor is still clinical diagnosis, because it is mainly in cases of biliary disease with stones that surgical results are good.

Granted a diagnosis of chronic cholecystitis then, the indications for operation are:

1. the presence of biliary colic which
   (a) predisposes to acute cholecystitis,
   (b) biliary malignancy.

2. the presence of stones in the gall bladder if there be indigestion of a biliary type present which debilitates the patient.

3. the presence of chronic cholecystitis with indigestion in the absence of stone, only when medical means fail to give sufficient relief.

In acute cholecystitis the problem is different, in early cases the inflammation is traumatic and only after 48 hours or so becomes infective. Immediate operation is feasible in the traumatic types but restoration of fluid sedation and heat should precede the infective type in the hope that the acute phase may subside and an interval operation be possible.

In the presence of jaundice, hemolytic jaundice must be ruled out, although fragment stones may be present in the bladder and cause colic in this condition the absence of itching, the high reticulocyte count, the absence of bile in the urine, and the galactose test are valuable in diagnosing the hemolytic type.

In the presence of jaundice.

1. Less than 50% of those with biliary disease will have stone in the common duct.

2. 83% of those with stones in the common duct will have jaundice.

Thus jaundice with biliary disease is an indication for operation unless the jaundice is deepening or there are chills and fever.

Preoperative preparation with vitamin K is indicated.

The causes for the small group of those with residual symptoms are:

1. erroneous diagnosis.
2. incomplete operation.
3. absence of proper post operative care to correct the associated physiological disturbances.

To try to ensure that the operation be complete, the indications for exploration of the common bile duct are:

1. presence of, or history of jaundice.
2. dilated common duct.
3. thickened common duct.
4. enlarged or thickened head of pancreas.
5. and of course palpable stone.

This has enormously increased the number of explorations but not the mortality.

D.P.B.

The Treatment of Bacillary (Flexner) Dysentery with Sulphaguanidine

By DAVID E. ANDERSON, L.R.C.P., M.R.C.S., D.P.M. and ROBT. CRUICKSHANK, M.D., M.R.C.P.

In this article the usefulness and preparation of sulphaguanidine are discussed, particularly from the standpoint of treatment of bacillary dysentery. It has been employed, by the authors, in 41 adult cases, with beneficial results, using 55 cases of the same epidemic as controls.

The dosage used was 3 grm. q. 8h. for 2 days, followed by 2 grm. q. 12h. for 5 days. The blood and urinary levels of this drug are always low, since sulphaguanidine gives its effect due to its poor solubility, hence its retention within the bowel. 20 toxic effects were noted, as a result of its use in these cases.

In the "Leading Articles" section of the Journal, (Br. Med. Journal, Oct. 11/41) sulphaguanidine is thoroughly discussed as an intestinal antiseptic. Because of its stability and poor absorption from the intestine, this drug is able to withstand the action of the intestinal

secretions and so reach the small and large bowel, to effectively carry out its antiseptic action upon marauding bacteria.

This drug is therefore useful in preoperative sterilization of the bowel, prior to resection or anastamosis, since it has been found to curb coliform and other intestinal bacteria.

The conclusion is reached that when the effects of sulphaguanidine are accurately known, regarding its capacity to restrain the growth of the various bacteria of the gut, it should prove to be a very valuable drug in the treatment of gastro-intestinal disease.

J.G.M.

The Importance of Air-borne Bacteria in the Operating Room

A method of control by sterilization of the air with ultra-violet radiation.

DERYL HART, M.D., J.A.M.A. 1941, 117: 1610.

In an effort to determine the cause of "unexplained infections" in clean wounds, extending studies at the Duke Hospital extending over a period of 5½ years revealed the fact that pathogenic bacteria sedimenting from the air of the operating room on the wound and sterile field was the chief factor in producing these infections. During the period extending from 1930 to 1936, the entire "aseptic technic" was repeatedly checked by bacteriological culture and as a result of these investigations certain facts were determined.

1. The usually accepted "aseptic technic" was satisfactory as far as the sterilization of instruments, supplies, and linen was concerned. The skin surface of patient and personnel after preparation for operation was usually free of organisms but after a period of moderate perspiration, staphylococci usually appeared.

2. Over 90% of unexplained wound infections contained staphylococci, usually of the hemolytic type.

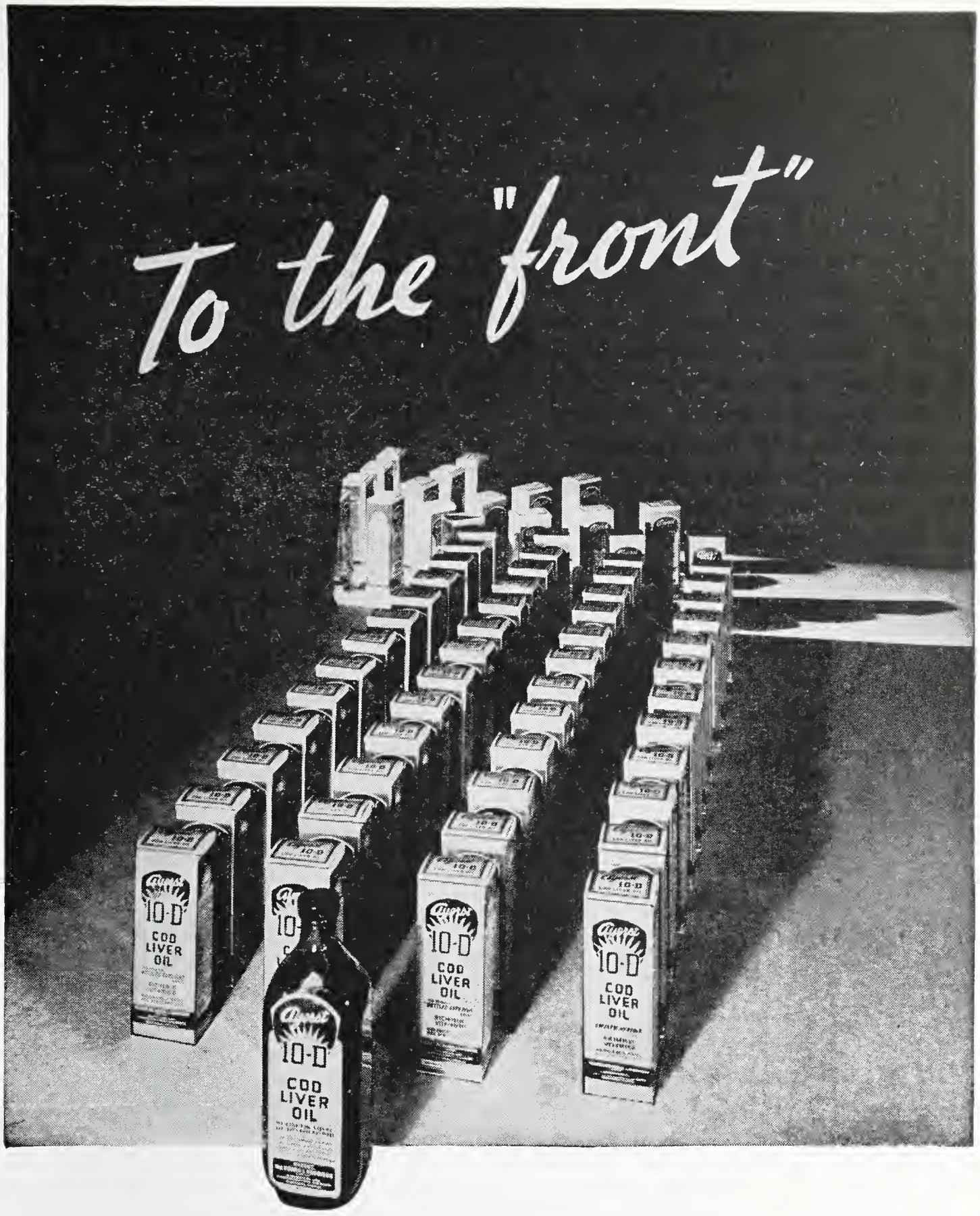
3. Cultures made in over 40 operating rooms in 16 states revealed the fact that staphylococci could invariably be recovered from the air of the operating rooms and near the operative incision. The incidence of air contamination with staphylococci was usually highest during the colder months and lowest during the summer and the incidence of wound infection varied accordingly. Studies on the nose and throat flora of personnel showed that the incidence of air contamination varied directly with the incidence of nose and throat contamination which in turn was highest in the winter and lowest in summer.

4. Severe streptococcic throat infections were rare and streptococcic wound infections occurred in only 5% of the total infections in clean operative wounds.

5. The number of sedimenting bacteria recoverable on an exposed plate of blood agar rose from an average of 0 to 4 colonies per hour of exposure at a time when the operating room had not been occupied for some hours to an average of from 50 to 100 shortly after the room was occupied. The degree of air contamination for the most part varied directly with the duration of occupancy, the number of occupants and the degree of nose and throat contamination of the occupants, and was further influenced by the amount of activity and talking and by the type of ventilating system used.

6. THE CONVENTIONAL GAUZE MASK DID NOT PREVENT THIS AIR CONTAMINATION EITHER IN PRACTICE OR EXPERIMENTALLY.

From a study of these facts the author was forced to the conclusion that pathogenic bacteria given off from the noses and throats of the occupants of the well-run operating room floating in the room and sedementing on the sterile field comprise the greatest breach in present day "asceptic technic" and present the greatest hazard of infection in large operative wounds. This is particularly



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true in those wounds in which hemostasis may be inadequate, trauma inevitable and immobility and other more or less ideal conditions for wound healing impossible to obtain.

After the elimination of as many of the above mentioned hazards as was possible, and with the installation of an effective ventilating system designed to supply bacteria-free air, combined with sterilization of the air in the operating room by means of ultra-violet radiation known by experiment to be effective, the following results were obtained.

1. A reduction in the per cent of infected wounds to from 1/20 to 1/100 of the previous level.

2. A marked reduction in the percentage of patients having a post-operative temperature rise.

3. General improvement in wound healing and diminished systemic reactions in patients having all types of operations.

4. The elimination of deaths from infection in clean wounds. Before the use of radiation there were 19 deaths from infected wounds in a group of 1782 large clean operations. Since the use of radiation no death has occurred from infection in a consecutive group of over 2600 similar operations.

R.J.W.

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